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ABSTRACT

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September, 1993

University of California at Berkeley

Carnegie Mellon University

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Linking Classroom Discourse and Classroom Content: Following the Trail of Intellectual Work in a Writing Lesson

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INTRODUCTION

> *Spoken language is the medium by which much teaching takes place and in which students demonstrate to teachers much of what they have learned.*
> (Cazden, 1986, p. 432)

As the main medium of instruction, the language of the classroom has long been considered a fine lens through which to view the teaching and learning that occurs inside schools. To date, most studies of classroom language have focused on how classroom talk differs structurally from everyday conversations, with little attention to the substance of the talk and therefore to the substance of the teaching and learning. These studies have shown that classroom conversations led by the teacher and involving the whole class typically have large structural junctures that delimit lessons and tasks, and phases within them (e.g., Bellack, et al., 1966; Erickson, 1978; Mehan, 1979; Sinclair & Coulthard, 1975). Within the phases, as in everyday conversations, turns at talk are organized in a sequential flow (Sacks, Schegloff, & Jefferson, 1974; Schegloff, 1972); however, rather than the pairs of turns typical of everyday talk (e.g., question-answer; greeting/greeting, offer/acceptance), the internal structure of classroom turn-taking frequently adds an evaluation by the teacher who normally also initiates the sequence (Mehan, 1979). These classroom turn sequences, then, typically have three parts rather than two—teacher Initiation (I), student Response (R), followed by teacher Evaluation (E) of the response.

Through understanding the I-R-E structures of whole-class lessons, researchers have come to important insights about teachers' and students' social roles and relationships inside classrooms. In particular, the teacher, by evaluating what students say, assumes the right to control the talk. Also, as initiator of the sequence, the teacher maintains the right to call on students and allocate turns, in essence organizing and orchestrating the discussions.

Within this teacher-controlled, turn-taking, participation structure, students must have certain discourse strategies and skills to perform well (Cazden, 1983; Griffin & Humphrey, 1978; Mehan, 1979; Sinclair & Coulthard, 1975). Mehan (1979) notes that being "right" in the classroom requires a student to Respond (R) to a teacher's Initiation (I) not only with the correct content, but also with the correct interactional timing and communicative conventions; otherwise, the student's response may be ignored, discounted, or not heard.

In addition to knowing when and how to respond, students have to understand what kinds of questions teachers are asking when they initiate the sequence. Specifically, the questions that dominate the Initiation in elementary classrooms are often "known-answer questions" (Cazden & Mehan, 1989; Searle, 1969). Not authentic questions at all, they function as indirect requests for students to display knowledge so that the teacher can test what the students know rather than teach them something new (e.g. Mehan, 1979; Sinclair & Coulthard, 1975). This type of "question" is foreign to many students entering school, making it difficult for them to participate, not because they do not know the answers but because they do not understand the question (e.g. Cazden, 1983; Edwards & Furlong, 1978; Heath, 1983). The importance of successful participation in classroom discourse to student achievement has prompted suggestions that the social skills and discourse grammars underlying successful participation in school be explicitly taught to maximize the chances for all children to participate fully in classroom learning (Cazden, 1981; 1988).

As Erickson (1982) notes, while descriptions of classroom "grammars" have gone a long way towards uncovering tacitly understood and accomplished behaviors that affect life and learning in classrooms, such analyses have little to say about the formal knowledge and skills which are being imparted. Heath (1978) and Mischler (1972) too have made similar points, calling for analyses that account for what students are learning. Lacking a way to gain insight into what students are learning from analyses of classroom talk, we have been quick to leap from information gained through analyses of I-R-E participation structures to conclusions about the kinds of cognitive activities being promoted. This leap has been especially facile since much of the I-R-E discourse studied has been conducted in elementary classrooms where known-answer questions are common (Wertsch & Toma, in press). Because of this link between the recitation function of instructional questions and the structure of I-R-E discourse, I-R-E discourse has been widely criticized for fostering a model of knowledge that views learning as the collection of an aggregation of facts which can be elicited (or recalled) on demand (e.g., Cazden, 1986; Cazden & Mehan, 1989; Wertsch, 1991; Wertsch & Toma, in press). Classroom talk that fosters the construction of knowledge is assumed to occur as genuine dialogues about subject matter, debates over the interpretation of information, mental experiments, or collaborative problem-solving. It is further assumed that this talk, even in the classroom, would follow the linguistic rules of everyday conversation, with a two-part turn-taking sequence, not the three-part, I-R-E structure common to classroom

conversation (Cazden, 1988). Although such assumptions have a certain intuitive appeal, they remain only assumptions since analyses of classroom discourse have not explicitly accounted for cognitive work.

This paper will suggest an approach to analyzing classroom talk that aims to account for the intellectual work of the classroom, that shows what stands to be learned. The focus is on an eleven-minute, teacher-led, whole-class activity that contains I-R-E exchanges, but that does not function to test students' knowledge. Rather, the talk, although not conversational in its structure, seems to engage students in constructing knowledge and in collaborative problem-solving. The goals of the analysis are to focus on the substance of the talk and also to take a new look at its structure, one that questions the inferences one can make based on *how* talk is structured for *what* is being taught and learned. We hope that by accounting for the intellectual work of classroom activities, this approach to discourse analysis will enable educators to judge the educational value of classroom activities as well as the participation structures in which such activities are housed. We map our analysis onto previous analyses of I-R-E participation structures, showing that high-level cognitive activities can take place within what previously has been considered a participation structure that necessarily minimizes the intellectual level of classroom activities. The classroom discussion to be analyzed takes place in a ninth-grade English class, during which the teacher helps his students prepare to write a character sketch.

BACKGROUND TO THE DEVELOPMENT OF A NEW APPROACH TO CLASSROOM DISCOURSE ANALYSIS

Three strands of theory support the development of this approach. The first is a theory of learning, since a major goal of the analysis is to understand classroom talk in order to view learning. Second, within the theory of learning is a theory of problem solving, since the focus of the analysis will be on the teaching and learning of complex skills, in this case written language. This problem-solving theory sets the stage for examining the overall substantive phases of the lesson. The third is a theory of language in use that helps us develop a method of analysis that will show substantively both what the teacher expects students to learn and what they actually have the opportunity to learn.

Learning Theory

For our theory of learning, we turn to the work of Vygotsky (1962, 1978), his colleague (Leontiev, 1981), and students of his work (Gal'perin, 1969; Moll, 1990; Newman, Griffin, & Cole, 1984; Wertsch, 1985) who argue that learning takes place through social interaction, particularly through language. The aspect of Vygotsky's theory that most informs the way we look at classroom talk is his theory of the twin processes of appropriation and internalization.

Vygotsky states that the information, activities, and mental strategies present in the interactions between teacher and learner are appropriated by the learner to guide his or her independent thinking. Gal'perin (1969) investigated the process of internalization, finding that the orientation learners receive to a new task critically determines the course of their subsequent learning of that task. His work suggests that receiving an orientation to a task in socially constructed activity assists learners to form a representation of that task. The learner's early representations may not mirror those of the teacher, although ideally, over time, the learner begins to approach the task as the teacher does (Newman, Griffin, & Cole, 1984).

In the classroom, the teacher is most often responsible for setting up learning tasks and engineering student participation in them. As the more accomplished participant in the classroom, the teacher understands the task and its requisite skills; even in classrooms where students actively take control of their own learning, it falls to the teacher to structure and constrain student activities toward valued ends. Through language the teacher shapes classroom activities and student participation in them.

The verbal introductions or orientations teachers give to new tasks are likely to present students with the task itself as well as the types of solutions the teacher will value. Even in collaborative dialogues teachers help students explore new ideas as they push their thinking forward. To take an example from classroom discourse, teacher questioning strategies can be seen to predict the type of response students should give; Heath (1978) notes that a "what" question calls for a label or fact, whereas a "why" question calls for an interpretation. According to Gal'perin, these orientations to a task may affect the ways students think about these same tasks in the future. Gal'perin's point is that what students and teachers do together determines what is appropriated and internalized for the future use of the individual student. Classroom discourse, then, has direct implications for student cognition, according to this Vygotskian perspective.

Problem-Solving Theory

Because we are interested in the cognitive import of classroom interactions, we draw also on recent work in learning and cognition, most notably on analyses of problem solving (e.g. Anderson, 1982; Greeno & Simon, 1984; Simon, 1973). While most studies of problem solving focus on think-aloud protocols taken while individuals attempt to solve problems of various types, we are interested in natural interactions between teachers and students as they focus on the completion of academic tasks. Nevertheless, we find it informative to extend concepts and constructs from problem-solving research and from research in cognition and learning in general, beyond the individual to the social group (see also Hutchins, in press; Miyake, 1982; Suchman, 1985).

A central construct in problem-solving theory is the "problem space," which, simply stated, is the current mental focus of the problem solver. This

focus might include task goals (proximal or ultimate), an interpretation of the task at hand, and relevant actions that might help to reach the proximal or ultimate goal (Greeno & Simon, 1984). Another way of understanding Gal'perin's claim, then, is that the "orientation to the task" received by learners leads to the construction of a problem space for the task, a framework of interpretation of the task and relevant actions in the task domain.

Polyani (1964) and Leontiev (1981) independently describe mental activity in terms of the focus of attention at any given moment in the process of doing a task. Leontiev describes the changing allocation of attention during target shooting (Leontiev, 1981); similar discussions of the focus of attention during complex tasks can be found in Anderson (1982), and for the area of written language in Bereiter (1980), Hayes and Flower (1980), and Scardamalia (1981). The teacher's talk during academic tasks helps to focus the students' attention on relevant information and actions, as well as on the goal of the task. Furthermore, teachers can effectively keep incorrect student responses from being tagged as "right" answers by other students (Griffin & Humphrey, 1978). Teacher talk can, therefore, function both as a lens to focus the attention of students, and also as a filter to keep stray information out of the arena of their attention.

Conversational Structure and Analysis

Conversation analysis proceeds from the belief that social structures, such as the structure of conversations, are produced by and for participants, in the process of interacting (see Sacks, Schegloff, & Jefferson, 1974; Schegloff & Sacks, 1973). That being so, it is reasoned that there must be mechanisms or devices by which participants in conversations understand one another and negotiate meaning. These mechanisms ought to be visible, then, to analysts of conversation, just as they are visible and interpretable to the interactants themselves, for, as Sacks says, the second turn of an exchange provides an analysis of the first.

One interpretive mechanism operating in conversational turn-taking that has been located by analysts is the conditional relevance of paired utterances. Many everyday turn sequences take the form of "adjacency pairs" which are "type related" (Sacks, 1987; Sacks, Schegloff, & Jefferson, 1974; Schegloff, 1968; 1972). Given a Question, an Answer is relevant; given a Greeting, another Greeting customarily follows. Similarly, given an Invitation, a response in the form of an Acceptance or Rejection follows. This patterned sequencing of turns allows conversational interactants to find the relevance and situational meaning in one another's utterances. If, for instance, a Greeting is not returned, the silence is "heard" and interpreted in some way—as a display of anger, as a marker of social status, etc.

An interpretive mechanism operating in everyday conversations that we believe could profitably extend to classroom interactions is the notion of "preference organization" (e.g. Bilmes, 1988; Levinson, 1983; Pomerantz,

Table 1
Preferred and Dispreferred Alternative Responses in Adjacency Pairs

First Turn	Preferred Response	Dispreferred Response
Request	Acceptance	Refusal
Offer or Invitation	Acceptance	Refusal
Assessment	Agreement	Disagreement
Compliment	Disagreement	Agreement
Question	Expected Answer	Unexpected Answer or Non-Answer
Blame	Denial	Admission
Display	Approval (Praise)	Disapproval

1984a; Sacks, 1987). In conversation analysis, preference organization refers to the principle of ordering that functions to make some responses more expected than others. A ranking of projected responses functions across alternative possible responses to a first conversational turn, and the normatively projected response is known in the literature as the "preferred" one. Levinson (1983) lists some preferred and dispreferred responses to common adjacency pairs, which are included (along with others from Pomerantz, 1984a and Bilmes, 1988) in Table 1.

The notion of preference has no necessary correlation to the personal, psychological preferences of interactants, as the preferred responses to Compliment-Disagreement and Blame-Denial adjacency pairs in Table 1 indicate. Rather, preference refers to the customary and normative sequencing of conversational interaction that allows conversational interactants to make inferences about meaning. Preference functions as an interpretive mechanism precisely because, as in conversational sequencing, when a projected response is not forthcoming, it is noticeably absent. In the case of blame, immediate denial is normative (preferred) and when not present, serves as an admission of guilt. Similarly, when a person displays his or her work to others, the customary response is an expression of approval or praise. In the absence of such praise, the person will infer that his or her work has been judged unworthy of it.

Preference refers, then, to the ranked ordering of alternative responses in terms of their normative projection (Sacks, 1987). A second, debated feature sometimes attributed to dispreferred responses arises from Pomerantz's (1984a) study of Assessment-Agreement and Assessment-Disagreement adjacency pairs. In this work, Pomerantz found that dispreferred turns tend to include delay devices such as silences, hesitating prefaces, requests for clarification, and accounts for the dispreferred response. Following Pomerantz, Levinson's (1983) definition of preference strongly relates preference to the linguistic notion of "markedness" (e.g. Jakobson, 1990). According to Levinson, preferred responses are "unmarked" in the linguistic

sense, while dispreferred responses are "marked" in that they are unexpected and often are accompanied by delays and disfluencies in talk, hedges, or extended explanations of some kind. According to these authors, delays, disfluencies, hedges, and the like are the markers that define responses as dispreferred.

Endeavoring to clarify the often misunderstood notion of preference, Bilmes (1988) argues that what many analysts take as markers of preference following Pomerantz's work are actually simply reluctance markers—ritualized aspects of interaction. Bilmes differentiates these reluctance displays from the inferential machinery of preference, which is based in the expectedness and relevance of particular conversational moves. He argues that while reluctance markers might appear in particular dispreferred turns, the presence or absence of these markers does not, itself, determine a turn's preference status. For Bilmes, as for Sacks, the concept of preference describes a resource, available in the structuring of conversational turns, that allows interactants to draw inferences about meaning.

Although Pomerantz acknowledges that the design of first turns invites particular kinds of second turns, the reluctance markers she correlates with dispreferred responses have tended to focus the attention of conversation analysts on preference as a feature of second turns, only. In fact, preference, as Sacks first defined it, is a feature of both first and second conversational turns, since "it takes separate activity for a questioner to design the question in such a way as to exhibit a preference for some answer, and an answerer to pick in accord with that preference" (Sacks, 1987, p. 58). Sacks writes that insofar as a question invites a particular type of answer, it "might be said to operate to shape an answer in partial independence of what the facts are" (p. 62).

In our work, we have adopted the notion of "preference," as Sacks, and later Bilmes, uses it, as a mechanism that allows conversational interactants (as well as analysts) to infer meaning. Following Sacks, we see preference organization as a feature of the ways both conversational partners design their utterances and orient to the utterances of one another. Following Bilmes, we understand preference to function distinctly from reluctance in conversation. Just as we understand conversations to be mutual achievements of the interactions of the participants, we view classroom lessons as a joint construction of the participating teacher and students, looking beyond a two-part conversational exchange for structural evidence of preferredness. We thus extend preference organization to the interactional structure of classroom discourse, taking student responses to instructional prompts as preferred or dispreferred rather than correct or incorrect in an absolute sense.

Making this extension requires adaptation to the particular context of the classroom, however. Whereas in ordinary conversation, both conversants presumably share the responsibility for structuring the conversation, in classrooms this responsibility falls mainly on the teacher. Students endeavor to participate in classroom discourse without necessarily being sure of what is customary or expected, without necessarily sharing knowledge in common

with the teacher, and without necessarily being facile at interpreting the conversational moves of the teacher. In classrooms, then, since the teacher is ordinarily the most skilled and knowledgeable interactant, he or she rather than the student will indicate the preference status of student responses. And he or she will have the authority to "pursue a response" by "clarifying, reviewing the assumed knowledge, and modifying [his or her] position" (Pomerantz, 1984b, p. 153). We thus look for the types of responses teachers invite as they display orientations to particular preferred responses, and look for preferred and dispreferred forms of student responses in the ways that teachers treat the responses, rather than in the particular structural features of the responses themselves.

We further extend preference analysis by using the structural features of teacher-student exchanges as clues to what counts as a preferred and dispreferred response, from the point of view of the teacher. Determining what the teacher sees as preferred and dispreferred student talk, as this is revealed in the *structure* of his or her talk, uncovers the teacher's goals for particular lessons as well as the intellectual *content* of these lessons. Further, student responses show how students understand the instructional activities in which they participate, their best guesses about what is "expected" and "oriented to" by the teacher. We thus look to what teachers and students say to one another and when as well as how they treat one another's talk, for the signs marking the trail of their intellectual activities.

Summary

We choose, then, to understand the function of teacher talk in a cognitive sense, as a lens focusing on and framing the particular information and actions relevant to the solution of a task. We view teachers as constructing problem-spaces in classroom discourse, orienting students to the problem at hand and pursuing "preferred responses," which further the goals they hold for particular instructional tasks. Through their talk in classrooms, then, teachers work to construct cognitive activities that will promote student learning. We claim that analysis of classroom talk can help educators locate and describe teachers' and students' intellectual work and the learning the talk makes possible.

DATA COLLECTION AND PREPARATION

Data Source

The eleven-minute sequence of classroom interaction that we analyze occurred as part of a larger study of the classroom practices of successful writing teachers (Freedman, with Sperling & Greenleaf, 1987). This larger study focused on the type of response students received to their writing and examined the role of feedback in learning to write. It included studies of

particularly talented teachers and their students, with the goal of learning from their practices. The whole-class lessons in both classes contained sizable segments of lesson time that followed I-R-E discourse structures. However, these same interactions also seemed to be full of teacher-led, collaborative problem-solving that involved much more than testing students by asking and rewarding their answers to known-answer questions.

Selection and Description of Teaching/Learning Episode

The episode analyzed here was selected from the video- and audio-taped record of classroom teaching for one of the teachers in the larger study, Mr. Peterson. This episode is typical of much of Mr. Peterson's whole-group teaching in that it presents an example of teacher-led, whole class discussion that involves teacher/student collaboration on an academic task. This episode provides many of the complexities with which we felt a systematic approach to classroom teaching/learning interactions would eventually have to deal.

Equally interesting to us was the potential intellectual value of Mr. Peterson's problem-solving approach in this episode. It seemed to create the conditions for what Brown, Collins, and Newman (1989) have labeled "apprenticeship learning" in a notoriously difficult domain, the domain of writing. Mr. Peterson makes visible to his students the normally invisible, largely cognitive process of revision, linking it to the essentially social, communicative practice which it serves. Beyond this, he engages his students in the revision process itself, giving them practice performing beyond their competence, coaching and guiding and everywhere assisting them (Cazden, 1983; Wertsch & Stone, 1979).

The episode is part of a five-week assignment sequence in which Mr. Peterson's ninth-graders write character sketches about people they know well and then about famous people, as preparation for writing sketches of characters in Dickens' *Great Expectations*. In this episode, they are focusing on an anecdote which will later become part of the first character sketch. Mr. Peterson has brought in a sample of a classmate's writing, a sample he chose because he finds its problems typical of those exhibited in most of the students' drafts. The episode involves Mr. Peterson and his students jointly revising one aspect of this writing. After this episode, Mr. Peterson and the class continue to revise a second aspect of the writing, with the entire lesson neatly divided into two distinct problem-solving episodes.

THE ANALYSIS

To prepare the selected episode for analysis, all talk was transcribed from audio tapes, with some reliance on field notes and video tapes for context-related interpretations. For a description of the transcription system and a line-numbered copy of the coded transcript, see Appendix A. The first part of the analysis involves looking for major shifts in the type and content of the

discourse. These shifts occurred at boundaries for three phases of problem solving in the episode—the Orientation, Solution, and Connection phases. The second part of the analysis involves looking closely at the Solution phase, where students participate to solve the problem posed in the Orientation. The focus is on how students' Preferred and Dispreferred responses, as they are marked by the teacher, shed light on what is being taught and potentially learned.

Problem-Solving Phases of the Episode: Orientation, Solution, Connection

Orientation. During the Orientation, Mr. Peterson sets up the revising activity in which he wants his students to participate. The students do not participate in this phase.

Mr. Peterson begins by handing out a ditto upon which the following student writing is typed:

> **My mother is an outgoing person when it comes to concerts. This time she calls up all her friends together for the night of Rick Springfield's concert in Concord. She tells my younger sister and me to invite friends of ours who would like to go. We all planned that we would go in two cars, which would be convenient. There were seven of us who went. We all went out to eat so that we would not have to stand in long lines at the concert, just to eat.**

He then focuses the students' attention as he explains, "Okay. There are two things that are lacking from these two paragraphs" (lines 1-2).[1] Then he quickly moves to the "first case" (line 4), the episode that is the focus of this analysis. He next summarizes the topic of the writing:

> ... um okay .. what's she talking .. what's she writing about here.
> She's writing about her mother.
> And her mother's excitement .. about .. going to this rock concert.
> All right. (lines 5-8)

Then he praises the writer:

> And actually,
> I,
> you know,
> I have to tell you that when you read the whole selection,
> it's really,
> .. it's very nice.
> I mean,
> uh .. it's uh .. it's a good good .. shows a .. reveals a good relationship .. between the person and her mother,
> and uh .. it was fun to read. (lines 9-18)

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[1] Line numbers refer to the transcript in Appendix A.

This praise lays the groundwork for his return to the focus for the lesson, what he finds amiss. Mr. Peterson explains that in the first of the two paragraphs the writer has failed to communicate the excitement of the event she has narrated—"very little of the excitement of this event is coming through" (lines 23-24).

After orienting the class to the general problem, the lack of excitement in the paragraph, Mr. Peterson focuses them further by orienting them to the solution he wants the class to work on during the lesson. He asks the class to pretend that they knew the character (the mother), to take on hypothetical authorship of the piece. He gives them an approach to solving the problem of lack of excitement in the writing:

> .. and all you ha' .. all you have to do is add a couple of sentences .. of ... concrete detail.
> .. To liven this up.
> And make it make it more exciting.
> And so we're going to try that,
> even though we don't know .. what the .. even though we don't know what the
> uh .. specifics are about the person's life.
> We could still do this as if it were us. (lines 27-34)

Mr. Peterson then reads the first paragraph, struggling a bit with the tense and the wording. As he reads, he revises the second sentence from **This time she calls up all her friends together for the night of Rick Springfield's concert in Concord** to **This time she phones all her friends, and invites them to the Rick Springfield concert in Concord.** Interestingly, Mr. Peterson does not invite his students to solve these problems with tense and wording; by taking care of them himself, he marks them as an aside or interruption from the real work he wants the class to accomplish collaboratively, namely adding the excitement.

The Orientation phase is marked by its exclusion of the students. Mr. Peterson is the only speaker. He sets up the activity in which he wants the students to participate. Only after he has oriented them to the general problem in the paper (lack of excitement) and to an approach to a solution (added detail) does he begin a transition to the next phase of the lesson which will include them.

Solution. In the Solution phase, Mr. Peterson expects the students to add the detail that will lead to increased excitement. He attempts to start into this phase by prompting his students to suggest possible revisions to the paragraph:

> [reading] **She tells my younger sister and me to invite friends of ours ..**
> **who would like to go.**
> All right.
> ... Okay.
> Now that's .. there's nothing wrong with that.
> But .. where .. okay .. after sh' after she says,
> [reading] **she telephones all her friends,**
> **and invites them uh to the concert.**

Right.
What *could* you do there.
What *could* you do there. [class is quiet, looking at dittos]
... Before you go on to the next sentence. (lines 68-79)

After this prompt, students provide no responses, and so Mr. Peterson tries again to elicit a suggestion for the revision. Mr. Peterson and his students spend the next few minutes trying to reach an understanding about the task. The students begin participating at this point, raising their hands and/or simply offering suggestions. The structure of the interaction has changed, with Mr. Peterson asking for student suggestions, students offering some, and Mr. Peterson commenting on the attempts, asking in another way for a suggestion, or offering greater explanation of what he is looking for.

Once a student offers a successful response, the Transition to the Solution phase is made.

S8: [reading] **The friends she invited .. the friends she invites are all presidents of the many Rick Springfield Fan Clubs of the Bay Area.**

T: Okay.. [momentary hesitation] o' okay.
Well so so let's say .. w' w' well let's not say,
.. let's not go over **she invites** again.
Right.
Let's not say the friends she invites.
L' let's start with **she .. invites,**
... right (unintelligible). [T writes on board]
All of .. she invites all of the Presidents .. of the Rick
.. I'm going to abbreviate Springfield,
Fan Clubs.
Who else does she invite.
... Anybody else?

S: (unintelligible)

T: [chuckles] ... Or actually,
she might,
.. actually we we're exaggerating.
She might have *a* friend.
.. Uh uh why don't we say,
She invites her friend who is President of the Rick Springfield Fan Club.
[reads while writing on the board] **She invites her friend.. who is .. President of the Rick Springfield Fan .. Club.**
Right.
... Who else does she invite.

S2: The secretary.

T: [laughs] The secretary.
... Even the sergeant of arms.
[laughs]

S: (unintelligible)

T: Oh just make somebody up.
We're working on this together now. (lines 179-210)

This Solution phase is marked by Mr. Peterson's use of inclusive language. He talks about "we," and suggests revisions using the words, "let's say.."; he even points out that the class as a whole is now a unit working together, saying, "We're working on this together now." The Solution is also accompanied by Mr. Peterson's writing of a revised version of the student paragraph on the chalkboard as this collectively created revision takes shape.

Connection. The final phase of the problem-solving episode, which we call Connection, is again marked by an exclusion of the students. We intend the label "connection" to call to mind the transfer of skills and actions to future activities where their use might be appropriate. During this Connection phase, Mr. Peterson alone speaks, reading the result of the class's work. By this time, the paragraph has been revised to:

My mother is an outgoing person when it comes to concerts. This time she phones all her friends, and asks them to get together for the Rick Springfield concert in Concord. She invites her friend who is President of the Rick Springfield Fan Club, an old high school friend, and even her dentist from San Rafael. She tells my younger sister and me to invite friends of ours who would like to go. I think of all the Rick Springfield fans I know, and others who have never heard of him.

Mr. Peterson comments on this new text and in so doing builds connections between the written feedback his students received on their individual papers and the revision they have just engaged in collectively. Specifically, he stresses the importance of adding detail to increase reader interest in a text.

Okay.
... Now.
The point is,
... how long did that take us.
It took us half a minute.
Right?
Well no.
Actually it took us about ten minutes. [laughs]
But if we had known what we were doing it would have taken us half a minute.
And,
all of a sudden,
this becomes a lot more interesting to read.
You see?
Because she doesn't stop at ... she doesn't .. she doesn't just go on to the next point.
I mean,
we get interested.
So uh ... now.
A lot of that, -
a lot of you were getting that stuff into your writing,
you don't, -

you know sometimes if you look through .. through your papers,
you'll see a star or something?
That means,
as I told you before,
that means,
that .. uh .. many of you have got stuff like this that I really like.
... Some specific detail. (lines 264-292)

Mr. Peterson's talk here comprises a "moral of the story," add detail, which he projects onto the future problem-solving activities of his students so they can take new knowledge and abilities away from this interaction with their classmates and their teacher.

The lesson continues under time pressure, with Mr. Peterson revising the next sentence in the paragraph without much participation on the part of his students. While earlier, and in more typical fashion for Mr. Peterson, the Solution is collaboratively achieved, here the Solution is modeled and demonstrated. Mr. Peterson then returns to a Connection phase, reiterating the point of the lesson, saying, "So then .. in other words, always push yourself, push yourself for details. (...) You'll have more fun writing, and (...) it'll be more interesting to read" (lines 327-333). Mr. Peterson then introduces the problem in the second paragraph of the student text, which he and his students go on to revise together.

Defining Preferred and Dispreferred Responses

Given the larger problem-solving segments of Orientation, Solution, and Connection, we turn our attention to the Solution to look for clues about the substance of the classroom talk, clues lodged in the conversational structure. We examine whether the teacher marks each student response as Preferred or Dispreferred, looking at how he treats the response in his subsequent turn. In this lesson Preferred Responses are easily differentiated from their Dispreferred counterparts in that they are used or taken up by the teacher, becoming resources in the lesson and helping to move it along. It is this conversational marking, the mechanism of uptake, that tells the students whether or not they have contributed to the solution of the problem that is at the core of the lesson. Just as the students get clues from their teacher, we too can make inferences about what counts as solutions to this problem as we study the teacher's conversational markings of the students' turns.

What does it mean, in this particular problem-solving episode, for a student response to function as a resource? Mr. Peterson has suggested the importance of revising the second sentence of the first paragraph. He has asked for more detail to liven up the passage. In this context, we have labeled a student's response as functioning to further Mr. Peterson's goals for the lesson if he uses the student's suggestion to help solve the problem in the paragraph. Since he functions as the leader, Mr. Peterson's uptake of student responses thus marks them as preferred or dispreferred.

We narrowly define uptake in the lesson to mean that Mr. Peterson either uses responses directly in a revision of the passage, or revises them for use in the collaborative revision. Since Mr. Peterson wrote the revision on the board and worked on student suggestions aloud during the lesson, we can unambiguously assign student replies to the category of Dispreferred Response (DR) or Preferred Response (PR) based on this definition of uptake.

During the transition from the Orientation to the Solution phase, Mr. Peterson tries to elicit suggested revisions from his students, but gets nothing from them that he can use. We therefore code the responses given by his students at this point as DR.

What *could* you do there.
What *could* you do there. [class is quiet, looking at dittos]
... Before you go on to the next sentence.

S1: (unintelligible)

T: What?

S1: I don't see what you're asking for. **{Clarifying Question}**

T: The question is what could could .. is is there a sentence you could *add* there?

S1: Decides? **{DR}**

T: Hmm?
...What's that?
No.
[in undertone] Nothing but blank expressions.
Okay.
So you don't think .. you can't you can't .. you can't think of any sentence that could possibly go in between .. uh th' .. [reading] **i' invites them to the concert and she tells my younger sister and me.**
Can't think of anything?

S1: And she then decides to .. she then decides to .. ask me and my sister to.. **{DR}**

T: Well .. before that.
.. Yeah. [calls on S2]

S2: Um.. even if you both want uh to invite, **{DR}**

T: You've skipped on ahead.
S3.
Got any ideas? [S3 does not respond. T chuckles]
... Okay. (lines 77-102)

During this transitional phase, Mr. Peterson works to orient his students to the solution, telling them to "write a sentence that will (...) suggest some of the kinds of people you might invite" (lines 126-127) "in between (...) **invites them to the concert** and **she tells my younger sister and me**" (lines 92-93).

With each DR, he delivers a new orienting remark that he hopes will call up the type of suggestion the class can use to construct a solution to the problem of adding excitement in the text. It is in this section that Mr. Peterson's talk, acting as a lens, focusing student attention on the relevant aspects of the task, is most obvious. From his orienting strategies, it is possible for students to begin to define what will count as a PR in this episode. He tells the students what kind of revision to attempt, and where in the text it might go. PRs in this context must therefore be suggested revisions both of the appropriate type and in the correct place in the text.

The Solution phase begins abruptly when a student offers a suggestion that fits these criteria:

S8: **[reading] The friends she invited .. the friends she invites are all presidents of the many Rick Springfield Fan Clubs of the Bay Area. (PR)**

T: Okay.. [momentary hesitation] o' okay.
Well so so let's say .. w' w' well let's not say,
.. let's not go over she invites again.
Right.
Let's not say **the friends she invites.**
L' let's start with **she .. invites,**
... right (unintelligible). [T writes on board]
All of .. she invites all of the Presidents .. of the Rick
.. I'm going to abbreviate Springfield,
Fan Clubs.
Who else does she invite.
... Anybody else? (lines 179-192)

Mr. Peterson takes up S8's suggestion, revising it verbally and writing it on the board. The change in the lesson here is dramatic as Mr. Peterson leaps to the board, jumping simultaneously into language that includes the students as collaborators, "Let's not say **the friends she invites.** (...) Let's start with **She invites.** (...) **She invites all of the Presidents .. of the Rick Springfield Fan Clubs."** (lines 185-190). Mr. Peterson continues to revise this student suggestion, writing and revising the unfolding version on the board.

During the Solution phase, however, not all of the student replies are taken up by Mr. Peterson. A few students offer suggestions for additions to the revision that Mr. Peterson considers and appreciates but fails to use in the unfolding revision. From these Dispreferred Responses, we get a still narrower definition of what counts as a Preferred Response.

T: ... Who else does she invite.

S2: The secretary. (DR)

T: [laughs] The secretary.
... Even the sergeant of arms.
[laughs]

S: (unintelligible)

T: Oh just make somebody up.
We're working on this together now.

S: (Members of her high school alumni association.)

T: Wh' wh' what?
What?

S: Members of her high school alumni association. {PR}

T: Well no.
A friend.
.. An old high school f' buddy.
Right?

S: Right. {Conversational Feedback}

T: Right. [calls on someone]

S: Buddy from high school. {DR}

S: Chum. {DR}

T: Chum [chuckles]
... I want to still say friends.. [writes on board]

S's: (unintelligible offers)

S6: Dentist. {PR}

T: Okay.
Who else does she invite.
.. What?

S6: Her dentist.
S: From San Rafael. [laughs] {PR}

T: [laughs] Okay.
Okay.
Okay.
And even,
.. that's good.
And even her dentist from San Rafael.
[writes on board] (lines 203-238)

While students offer "the secretary" (line 204) to the list of friends, and alternative for "friend," including "buddy" (line 221) and "chum" (line 222), Mr. Peterson considers but ultimately rejects these suggestions. In these cases, Mr. Peterson adds a filter to his lens, not using revisions that in his judgment do not work—revisions that echo previous revisions too closely, revisions

that simply reword without adding detail. Preferred Responses, then, must add new and appropriate detail.

In this lesson PRs contribute to the goal of demonstrating how a particular revision strategy might increase the interest and excitement generated by a text. As the most expert writer in the interaction and as the discussion leader, Mr. Peterson maintains the prerogative to judge the extent to which student contributions will work towards this end. For their part, the students have shared many hours with Mr. Peterson and his judgments and explicit teaching about good writing. To some extent, then, Mr. Peterson and his students are coming to share a model of good writing based on their history together, with that model continuing to be built and strengthened through interactions such as this one (see Greenleaf, 1984, for exposition of these student and teacher models).

Distinguishing Preferredness from Evaluation in I-R-E Discourse

The section of classroom talk we have been analyzing could be seen as moving in the three-part, I-R-E structure common to teacher-led instruction. Mr. Peterson begins the exchange by asking his students to suggest revisions to the paragraph; they respond with some revision suggestions; and he closes the three-part exchange with a comment about their suggestions.

	Teacher Initiation	*Student Response*	*Teacher Evaluation*
1.	T: I want to know something about these friends.		
		(...)	
		S8: [S8 raises hand high] [reading from her writing] **The friends she invited .. the friends she invites are all presidents of the many Rick Springfield Fan Clubs of the Bay Area.**	
			T: Okay.. o' okay. Well so so let's say .. w' w' well let's not say, .. let's not go over she invites again. Right. Let's not say the friends she invites. L' let's start with she .. invites,

Teacher Initiation	*Student Response*	*Teacher Evaluation*
		... right [unintelligible] [T writes on board] **All of .. she invites all of the Presidents .. of the Rick** .. I'm going to abbreviate Springfield, **Fan Clubs.**
2. T: Who else does she invite. ... Anybody else?		
	(...)	
	S2: The secretary.	
		T: [laughs] The secretary. ... Even the sergeant of arms. [laughs]
3. T: Oh just make somebody up. We're working on this together now.		
	(...)	
	Sx: Members of her high school alumni association.	
		T: Well no.
4. T: A friend. .. An old high school f' buddy. Right?		
	Sx: Right.	
		T: Right.
5. T: [calls on someone]		
	Sx: Buddy from high school.	
	Sx: Chum.	

Teacher Initiation	*Student Response*	*Teacher Evaluation*
		T: Chum [chuckles] ... I want to still say friends.. [writes on board]
	(...)	
6. T: Okay. Who else does she invite. .. What?		
	S6: Her dentist.	
	Sx: From San Rafael. [laughs]	
		T: [laughs] Okay. Okay. Okay. **And even,** .. That's good. **And even her dentist from San Rafael.**

Various methods of delivering overt and covert negative and positive evaluations in classroom discourse have been described by Griffin and Humphrey (1978). Mr. Peterson's comments about the revisions his students suggest can be categorized as forms of positive and negative evaluation, according to Griffin and Humphrey's scheme. For example, the student suggestion that begins the Solution phase of the lesson (exchange 1 above) receives a "covert negative evaluation" as Mr. Peterson hesitates, then accepts and revises the contribution extensively. The student suggestion of "the secretary" (exchange 2), however, receives a positive evaluation from Mr. Peterson, who repeats the student contribution (one of the markers of positive evaluation), laughs appreciatively, and embellishes the remark: "The secretary. Even the sergeant of arms." In exchange 3, a student, offering, "Members of her high school alumni association," receives, "Well no" from Mr. Peterson (an "overt negative evaluation"). However, Mr. Peterson goes on to revise this offer, which figures in the final revision of the paragraph. The student suggestion of "chum" in exchange 5 receives an appreciative chuckle, like "the secretary" of exchange 2. Exchange 6 receives the only "overt, positive evaluation"; a student offers, "her dentist" and another student adds, "from San Rafael" in response to Mr. Peterson's question, "Who else does she invite?" This joint offer receives a laugh and praise, "That's good," from Mr. Peterson.

It is interesting to note that responses receiving overt and covert negative evaluations (exchanges 1 and 3) and the one receiving the overt positive

evaluation are taken up by Mr. Peterson and figure into the solution of the writing problem he has identified; all of these are by definition Preferred Responses. In contrast, other responses that Mr. Peterson evaluates positively (exchanges 2 and 5) are not taken up even though they are clearly appreciated by Mr. Peterson; they are, therefore, Dispreferred Responses. The revisions Mr. Peterson makes on student contributions can be seen as ways of covertly and negatively evaluating student work, in former analysis systems (e.g., Griffin & Humphrey, 1978). However, the contributions themselves may function as resources for the lesson, helping Mr. Peterson and his students toward an eventual solution to the problems in the student text. By definition, since DRs are not taken up by Mr. Peterson, he never revises them.

In this section of talk, then, we find evidence to show that teacher evaluation, both positive and negative, is a separate dimension in classroom discourse (at least of this type) from preferredness as we have defined it. Table 2 illustrates the finding that PRs can be both positively and negatively evaluated by the teacher. The distinction between the dimensions of preferredness and evaluation foregrounds the contribution each analysis system makes to an understanding of classroom discourse.

A focus on the participation structure of classroom discourse reveals the tri-partite rhythm of teacher-led discussion, shedding light on the ways teacher evaluations of student talk help to direct and maintain control of these discussions (Griffin & Humphrey, 1978; Mehan, 1979; Sinclair & Coulthard, 1975). The structure of classroom discourse has powerful, indirect implications for student learning in that it constrains how students must display knowledge and participate in classroom activities. The preference analysis that we demonstrate here allows us to use the structure of classroom discourse as clues to the cognitive activity that this structure serves to orchestrate. Teacher uptake of student offers, independent of teacher evaluation of those offers, focuses student responses in this exchange on potential solutions to a writing problem, calling attention to precisely those problem-solving strategies that will assist the class in reaching the goal the teacher has set for them. Preference analysis, as we have adapted it, focuses on the cognitive content of classroom discourse, which has direct implications for student learning.

Defining Preference Reveals Cognitive Content of Lesson

Carefully defining preference from the point of view of the classroom teacher and specifying the goals of activities as they are revealed in teacher uptake of student utterances in classroom interactions allows us to make inferences about the importance of these interactions for learning. Specifically, by looking closely at what counts as Preferred Responses in this revision episode, we should be able to determine what (if anything) students stand to learn about written language. The analysis of the transition of the

Table 2
Student Replies Along Dimensions of Evaluation and Preferredness

Exchange #	Student Response	Pref.	Eval.	Revision by Teacher
1	The friends she invites are all presidents of the Rick Springfield Fan Club	+	-	She invites her friend who is President of the Rick Springfield Fan Club
2	The secretary	-	+	

lesson, from the Orientation to the Solution phase, shows that to give PRs, students must apply the desired revision strategy in the appropriate place in the text. We now extend our analysis to the revision strategies invoked by the teacher and the students in this episode and speculate about the value of the episode for students who are learning to write.

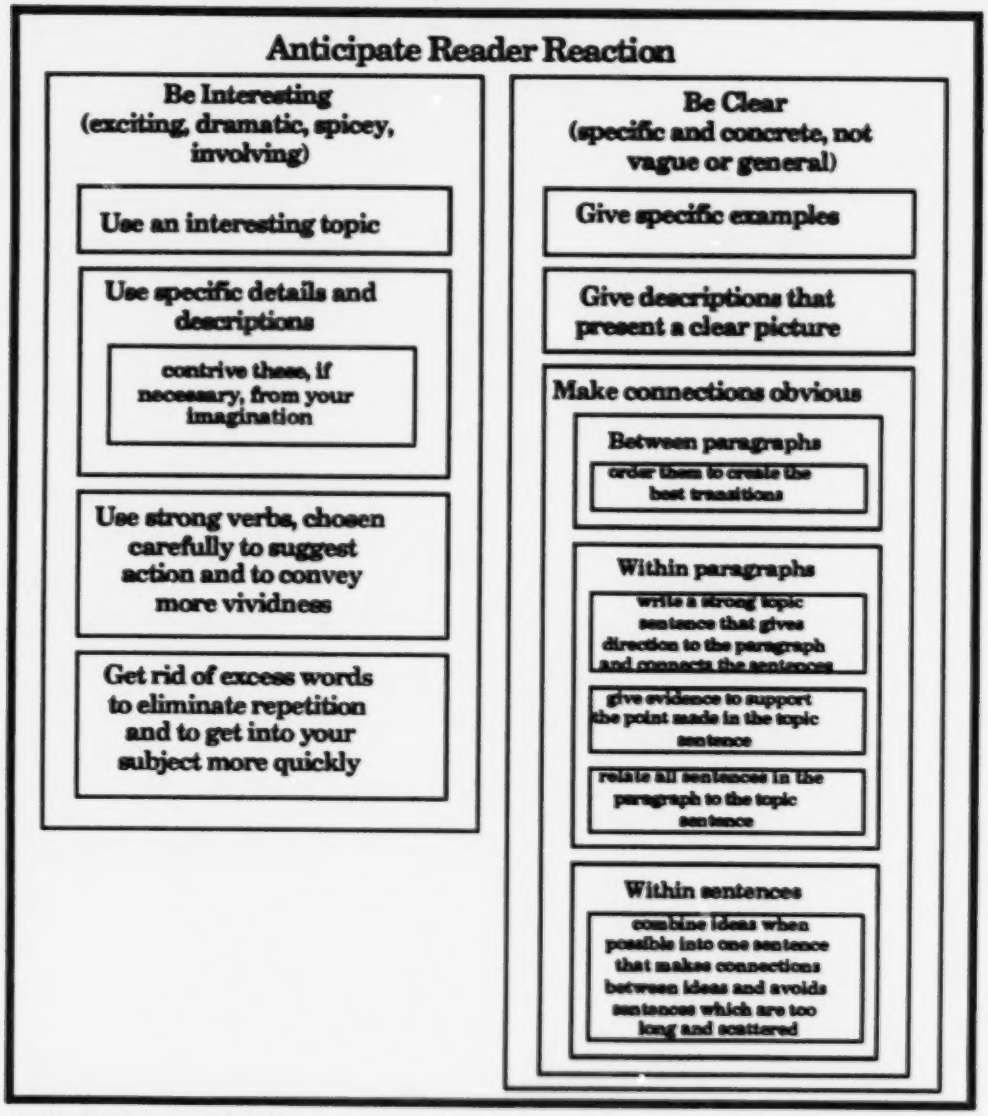
As Mr. Peterson leads his students through this revision, they have an opportunity (at least potentially) to appropriate and internalize the strategy Mr. Peterson promotes and that they use together in class (Vygotsky, 1962, 1978). During the Orientation and the transition to the Solution, Mr. Peterson defines the problem space for the upcoming revision activity. The problem space not only includes a representation of the problem and the desired goal of the problem solving, but also identifies the relevant objects and features of the problem and the strategies the problem solver should apply (Greeno & Simon, 1984).

The problem, simply put, is to make the text interesting and exciting. To help students solve the problem, Mr. Peterson teaches the use of specific, enlivening detail. Figure 1, developed from a thematic analysis of all of Mr. Peterson's value statements across seven weeks of classroom talk, shows how this strategy fits into Mr. Peterson's model of good writing, and how it connects to higher goals of composing, from his point of view.

In the Orientation phase of this lesson, Mr. Peterson asks his students to add detail as a revision strategy. However, his students do not immediately move into the Solution phase of the lesson after Mr. Peterson provides his initial cues. In the initial stages of this activity, there is a mismatch between the revision skills Mr. Peterson wants his students to display, and the revision skills they seem able to apply in this context.

Mr. Peterson's goal of evaluating and revising the passage while keeping in mind particular evaluative criteria can be expressed in rule-like form, similar to the production rules of Hayes and Flower's (1980) model of the composing process. Mr. Peterson reads and evaluates the text, finding it to be dull in his view as a reader. This "triggers" a fix, which, according to his model of ideal text in Figure 1 and his remarks during this lesson, could be expressed in the following form:

Figure 1
Mr. Peterson's Model of Ideal Text †


Anticipate Reader Reaction
Be Interesting
(exciting, dramatic, spicey, involving)
Use an interesting topic
Use specific details and descriptions
contrive these, if necessary, from your imagination
Use strong verbs, chosen carefully to suggest action and to convey more vividness
Get rid of excess words to eliminate repetition and to get into your subject more quickly
Be Clear
(specific and concrete, not vague or general)
Give specific examples
Give descriptions that present a clear picture
Make connections obvious
Between paragraphs
order them to create the best transitions
Within paragraphs
write a strong topic sentence that gives direction to the paragraph and connects the sentences
give evidence to support the point made in the topic sentence
relate all sentences in the paragraph to the topic sentence
Within sentences
combine ideas when possible into one sentence that makes connections between ideas and avoids sentences which are too long and scattered

† Adapted from Greenleaf, 1984

EVALUATE (TEXT INTERESTING)
IF RESULT = TEXT [- INTERESTING], CHECK (SPECIFIC DETAILS)
IF RESULT = NO SPECIFIC DETAILS, ADD TEXT [+ DETAILS]

According to this rule, writers must evaluate their texts from the point of view of their readers to determine if it is interesting. If writers find their texts uninteresting, they must check for specific details that give life to the writing. If these are absent, writers must add text that has the quality [+ DETAILS], in other words, is full of specific detail. As Mr. Peterson asks his students to add a sentence with specific detail to liven up the piece, a Preferred Response must, at minimum, display use of the strategy ADD TEXT [+ DETAILS]. Mr. Peterson's students try to comply with his request that they add to the text. At first, however, they do not use Mr. Peterson's revision rule.

Instead, Mr. Peterson's students seem to be influenced in their replies by two rules of their own. The first and perhaps primary rule haunts formal schooling in general. It admonishes students to please the teacher, to do it "just the way you wanted me to" (line X). The second seems to be a general strategy for making written pieces longer and may be a sub-category of pleasing the teacher. It could be characterized by the following production rule:

IF TEACHER SAYS ADD, MAKE TEXT [+ LONG]
TO MAKE TEXT [+ LONG], ADD MORE

Here, the operator ADD MORE is unspecified. The students seem simply to add, sometimes by adding more narrative ("They all drove over and.." [line 151]), sometimes by substituting a phrase that is longer for a shorter one ("And she then decides to ask me and my sister so.." [line 95]), but not, it seems, under the control of a higher goal other than that of pleasing the teacher. The students thus orient to Mr. Peterson as an authority figure, rather than as a representative reader with a need for particular kinds of information from a text. In Mr. Peterson's revision rule, however, adding text is intimately linked with the goal of making the text interesting, and beyond that to meeting the needs of an abstract, internalized, general reader (see Figure 1). This general reader requires adequate information, in the form of specific examples and details, to maintain interest in and to comprehend a text. Were Mr. Peterson's students to succeed in pleasing him, they would also meet the needs of this general reader, as Mr. Peterson envisions him or her.

In the course of the lesson, Mr. Peterson gets his students to contribute to the revision *as if* they understood the task and revision strategy as he did. How do these contributions come about? On examination of the transcript, it is clear that Mr. Peterson successively calibrates his elicitations to his students' abilities to respond. After framing the problem and solution for them—"very little of the excitement of this event is coming through" (lines 23-24), "all you have to do is add a couple of sentences of concrete detail" (lines 27-28)—Mr. Peterson asks the very general question, "What *could* you do there?" (line 77).

Here, to give a Preferred Response, students would have to keep in mind both the problem and the solution framed by Mr. Peterson. When they don't respond, Mr. Peterson tries again with, "Is there a sentence you could *add* there?" (lines 83-84). He reminds his students that they could solve the problem by adding a sentence. When they still do not respond, Mr. Peterson summarizes the hints he has given the class so far. He also reminds his students not only of what they must do but also of where they must do it; "You can't think of any sentence that could possibly go in between ..." (lines 91-92).

The students finally offer some sentences to add, but these do not fit the criteria [+ DETAILS]. It seems clear that Mr. Peterson's students are adding a sentence without adding detail, operating with the ADD MORE strategy instead of the more sophisticated strategy Mr. Peterson is expecting. Mr. Peterson then tries to get his students to take the role of a reader by presenting them with a hypothetical conversation and asking them what questions they would have in this conversation: "Suppose I say (...) I'm going to invite all my friends to come to this class with me tomorrow. (...) You wouldn't have any questions?" (see the side sequence beginning with line 104). When a student is able to respond, Mr. Peterson makes the tie between the revision task and this hypothetical conversation explicit and directs the students' attention to the content of the sentence they must write. He says, "..just make something up. Write a sentence in there .. that might give you some idea of who these people are" (lines 119-121). This directive finally elicits some activity on the part of most of the students in the room, who turn to writing. However, when it turns out that the students are still adding text that does not add detail and interest to the piece, Mr. Peterson himself takes the role of the reader, saying, "I want to know something about these friends" (line 158).

At this point, a student asks a clarifying question: "The mother's friends?" (see the side sequence beginning with line 159). Mr. Peterson verifies that he is looking for details about the mother's friends. S5, the last to offer a DR, explains, "I thought you meant the kid's friends. That's why I said that" (lines 165-166). When Mr. Peterson suggested that the students imagine "it was you.. inviting all your friends to this concert" (line 123), he may have confused them into thinking they were to add information about their own (or their peers' in the passage) friends. However, examination of their DRs show that they are not adding detail about anybody's friends. While they admittedly are not in the correct place in the text, more importantly they are not applying the revision strategy Mr. Peterson is eliciting. Had they gone on to add detail about the "kid's friends," it would have been clear that they could apply the requested revision strategy. However, up to this point in the lesson, there is no evidence to suggest that they can apply it.

Finally a student offers a sentence, which, although it is not perfect, contributes the essential feature of adding detail to the piece—"The friends she invites are all presidents of the many Rick Springfield Fan Clubs of the Bay Area" (lines 179-180 and above). Mr. Peterson is then able to collaborate with the class to construct a solution to the problem he posed to begin with.

Mr. Peterson's fine tuning of his elicitations to the responses of his students during the Transition phase is reminiscent of the calibration that occurs when adults help children carry out tasks (Cazden, 1983; Rogoff & Gardner, 1984; Ninio & Bruner, 1978; Scollon, 1976).

Throughout the lesson, Mr. Peterson shares the responsibility for the revision task with his students. He divides the task of evaluating and fixing the text, taking on the role of the evaluator and insisting that his students participate in the fix. He thus divides up the cognitive work that needs to get done, and holds out, with a great deal of difficulty, to get his students to use the operator ADD TEXT [+ DETAILS]. This cognitive division of labor has been noted in other collaborative problem-solving activities (Forman & Cazden, 1985; Levin, et al., 1985). Besides orienting the students to a particular problem space, Mr. Peterson is actively working to involve his students in the revision, interactively finding their entry level in the task, and appropriating their responses into the activity he has defined (Newman, Griffin, & Cooe, 1984).

By insisting that his students participate in the problem's solution, Mr. Peterson takes upon himself the responsibility of finding the level at which they can participate, their zone of proximal development (Vygotsky, 1962, 1978). By characterizing this collaborative revision as an activity in Mr. Peterson's students' zones of proximal development, we make two claims: first, that these students do not initially have the competence to attain the desired solution on their own; and second, that they can solve the problem that Mr. Peterson has defined with his help. Clearly the second claim, that the class successfully accomplishes a revision, is verifiable by analyzing the transcript. As for the first claim, one key hypothesis about the relative lack of revision by student writers is that their difficulties come less from lack of knowledge than from the fact that the labor involved erects barriers to revising (Daiute, 1985). Yet Mr. Peterson waits to transcribe the revisions the students make, minimizing the labor for these students. It is also possible that the students do not understand the directions, are unclear about what Mr. Peterson wants. However, there is little evidence either from their behavior in class or from their writing that these students could solve the problem Mr. Peterson perceives in this piece of writing on their own, even when perfectly clear about the directions, which have been echoed in multiple activities in this classroom.

Rather it seems that Mr. Peterson gains the students' active participation by engaging in what has been called "proleptic teaching" (Wertsch & Stone, 1979); Mr. Peterson gauges his students' performance and gets them to take steps towards closing the gap between their less skilled behavior and his skilled behavior as a writer. We do not want to claim that Mr. Peterson's students are unable to generate detail, that they do not have the skill required, but rather that they do not initially perceive this written piece, like much of their own writing, to necessitate it. It is here that Mr. Peterson's lesson makes its contribution. Ultimately, having practiced using a particular revision strategy in a collaborative problem-solving episode in class, Mr. Peterson

hopes his students will make the connection between this task and their own composing: "So then, in other words, always push yourself for details. You'll have more fun writing and it'll be more interesting to read."

DISCUSSION AND CONCLUSIONS

Looking closely at an eleven minute segment of classroom interaction is a little bit like looking closely at the threads of a tapestry. At this level of detail, it is easy to magnify small flaws and even easier to miss the significance of the individual threads in the larger weave. Yet we treasure handmade goods precisely because the occasional loose thread, the slightly uneven texture, is testimony to the masterful crafting of the whole. We think it important, then, to stand back momentarily to appreciate the way this eleven minute episode fits into the larger design of Mr. Peterson's teaching.

We have already described the sequence of character sketches that led from the personal and familiar to the removed and abstract. Mr. Peterson carries important strands of instruction through all of these assignments, giving students practice with the specific kinds of thinking and writing they will need to carry out these assignments successfully and engaging them in a process of planning, crafting, and recrafting particular pieces of writing. Instructional contexts and strategies become important aspects of the design, as students work in groups to practice solving problems collaboratively, as these groups engage in competitive games against one another, as students work independently to write and rewrite, and as Mr. Peterson flexibly moves from whole class lessons to small group activities to individual conferences with students (Freedman, 1987; Freedman, with Sperling and Greenleaf, 1987; Freedman & Bennett, 1987; Sperling, 1990). The theme that holds this tapestry of teaching together is Mr. Peterson's characterization of writing as a process of solving problems. This important theme is woven throughout Mr. Peterson's writing instruction, and it is the thread we have examined closely in the eleven minute segment of instruction analyzed in this article.

Recognizing that the coherence and meaning of particular moments of classroom interactions derive from larger patterns of life within the classroom, we nevertheless want to claim that the close view of classroom interactions afforded by discourse analysis yields important insights into the cognitive content of teaching and learning. The preference analysis of this collaborative revision task provided clues to the underlying cognitive structure of the task, especially the revision strategy Mr. Peterson wanted his students to apply. By analyzing the student responses that Mr. Peterson took up during the lesson, we were able to see what cognitive skills successful participation in the activity required and thereby have an idea of the potential cognitive benefits of this activity.

In problem-solving interactions, in particular, we expect teacher questions to function to delineate the problem space for the students, and we further expect Preferred Responses to be those that stay within the target space,

whether they are "correct" or not. On the other hand, in other kinds of lessons, for example when the teacher leads an interaction aimed at quizzing students or involving them in reciting factual information, Preferred Responses will be those that give correct answers and accurate information. By carefully describing what kinds of responses are marked as Preferred and Dispreferred by the teacher, we expect the goal of the activity and its cognitive demands to become clear.

In this paper, we have attempted to disentangle a discourse form from the analysis of its cognitive function in teaching and learning, notions which have often been fused, especially in critiques of I-R-E participation structures. In these critiques, I-R-E discourse is often assumed to limit student participation to recitation and rehearsal of pre-packaged facts. Here, we show how the I-R-E structure can support a collaborative problem-solving session in which students play an important role in the construction of the problem's solution. As Cazden (1986) reminds us, any surface language form can have multiple meanings, and there is no simple relationship between discourse forms and functions. The analysis we present here shifts the focus away from the relationship between form and function, looking instead at the cognitive work involved in the interactive construction of classroom activities.

We recognize that we have used the technical apparati of conversation analysis, particularly the theoretical construct of preference organization, in unconventional ways. Our goal is to apply the tools of conversation analysis to the unique social environment of the classroom, which is at once intentionally orchestrated by the teacher and situationally constructed by the interacting teacher, students, and classroom tasks. Much work remains to be done in refining a preference analysis system for analyzing classroom discourse. In particular, the identified phases and definitions of preferredness must be applied to many more classroom lessons. Although we hypothesize that preference analysis can be extended to account for different kinds of interactions, we now need to verify that it can. We are concerned to show that the preference account we propose here is not limited to the particular type of interaction studied. We also would like to see if preference analysis can be fruitfully applied to essentially different, but potentially cognitively important interactions, such as teacher/student conferences or peer tutoring interactions.

Another essential step in the research would be to combine this kind of classroom language analysis with case studies of individual students as they participate in activities in the classroom and attempt to write pieces on their own. Only with data on individuals will it be possible to verify whether students can at first only display particular problem-solving skills with a teacher's assistance, and whether, by participating in interactions like the one studied here, they actually acquire the ability to apply these skills in their own, independent problem solving.

We began this article with a quotation—"Spoken language is the medium by which much teaching takes place and in which students demonstrate to teachers much of what they have learned" (Cazden, 1986). We have tried to

show how a successful teacher of writing constructs a problem-solving lesson out of the written language of a student and the talk of the class. He poses a problem, weaving the words of his students into its solution. Unweaving these words to reveal their cognitive warp and woof has been our task, a task which has been assisted by the preference analysis system we have described here.

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APPENDIX A

Transcription Conventions

Each line of the transcript represents a fluent burst of talk, a prosodic unit which Chafe argues comprises a single cognitive entity or "idea unit" (Chafe, 1980; Danielewicz & Chafe, 1985). Chafe argues that disfluencies occur at points of greatest cognitive load on the speaker, and since we wanted to investigate the conceptual content of the lesson as well as its social structure, we retained disfluencies such as pauses and false starts.

Whenever periods appear in the transcript, the preceding line should be read with a falling intonation. All questions except yes or no questions in English are delivered with falling intonation rather than a rapidly rising one. Therefore questions, ordinarily marked by punctuation as such, appear in the transcript ending with a period. The commas in the transcript mark rising intonation, similar to the voice contours heard when a speaker is listing objects. Lines ending in commas should therefore be read with a list-like rise at the end. Ellipses mark pauses, and pauses that endure for longer than usual in conversation appear in triples on their own line. In each case, a description of the classroom context accompanies the denotation of these long pauses in the transcript.

The speakers are designated by an initial in the left margin at the point in which they begin speaking. Mr. Peterson is designated by the initial T (for teacher), and students, when recognizable from the video and audio tapes, are given numbers. When a student speaker cannot be confidently identified, he or she is designated simply as S. The transcript lines are numbered for easy indexing. When text is read the words appear in the transcript in **bold type**. Laughter, participant activities, and researcher interpretations of the current activity appear inside brackets in the transcript. When we cannot hear an utterance well enough to interpret it, we place our best guess of its content, or simply the word "unintelligible," in parentheses.

Transcript of the Episode

Orientation Phase

T: Okay.
There are two things that are lacking from these two paragraphs.
Both both of .. in both cases it's a little different.
In the first case,
... um okay .. what's she talking .. what's she writing about here.
She's writing about her mother.
And her mother's excitement .. about .. going to this rock concert.
All right.
And actually,
I,
you know,
I have to tell you that when you read the whole selection,
it's really,
.. it's very nice.
I mean,
uh .. it's uh .. it's a good good .. shows a .. reveals a good relationship .. between the person and her mother,
and uh .. it was fun to read.
.. But.
B'beginning here,
.. we uh .. it uh .. seems to me,
beginning here,
.. we don't have uh .. none of the .. very little of the excitement of this event,
is coming through.
.. Um ... okay,
so,
.. and all you ha' .. all you have to do is add a couple of sentences .. of ... concrete detail.
.. To liven this up.
And make it make it more exciting.
And so we're going to try that,
even though we don't know .. what the .. even though we don't know what the uh .. specifics are about the person's life.
We could still do this as if it were us.
... All right?
Okay.
[reading paragraph] My mother's an outgoing person.
.. Uh .. when it comes to concerts.
That's fine.
Just leave it at that.
All right?
... Uh ... [reading] this time,
she's putting this in the present tense,
but that's perfectly all right.
As long as she's gonna tell the whole story in the present tense.
...
Right.

[reading] **This time she calls up all .. all all a' ..c' she .. she calls up all her fr' ... she calls up all her friends.**
.. I made a mistake in typing this.
Let's say.. let's say,
[revising text] **she calls all her friends .. together .. for the n',**
well we need to settle on some language here. [class laughter]
[revising] **She telephoned,** [laughs]
this time she telephoned,
Let's say .. let's cross out these words.
We want to say this.
... Uh.
[revising] **... This time ... she telephones all her friends, and invites them to .. the Rick Springfield concert at Concord.**
... or in Concord.
Right.
This time.
Okay.
[revising] **She telephones all her friends, and invites them to the Rick Springfield concert at .. in Concord.**
Okay.
[reading] **She tells my younger sister and me to invite friends of ours .. who would like to go.**
All right.
... Okay.
Now that's .. there's nothing wrong with that.
But .. where .. okay .. after sh' after she says,
[reading] **she telephones all her friends, and invites them uh to the concert.**
Right.

Transition to Solution Phase

What *could* you do there.
What *could* you do there. [class is quiet, looking at dittos]
... Before you go on to the next sentence.

S1: (unintelligible)

T: What?

S1: I don't see what you're asking for. **(Clarifying Question)**

T: The question is what could could .. is is there a sentence you could *add* there?

S1: Decides? **(DR)**

T: Hmm?
...What's that?
No.

[in undertone] Nothing but blank expressions.
Okay.
So you don't think .. you can't you can't .. you can't think of any sentence that
could possibly go in between .. uh th' .. [reading] I' invites them to the
concert and she tells my younger sister and me.
Can't think of anything?

S1: And she then decides to .. she then decides to .. ask me and my sister to.. {DR}

T: Well .. before that.
.. Yeah. [calls on S2]

S2: Um.. even if you both want uh to invite, {DR}

T: You've skipped on ahead.
S3.
Got any ideas? [S3 does not respond. T chuckles]
... Okay.
[T interrupted by S sharpening pencil, pauses to wait until S is finished]

Side Sequence

... Suppose I say,
suppose I say,
uh I'm going to invite all of my friends to this class tomorrow.
... Invite all my friends to come to this class with me tomorrow.
What .. you wouldn't have any questions?

S4: What friends? {PR}

T: What .. what?
... Yeah.
What are these friends like.
.. I mean,
what are they .. what are they .. uh ... who who who are these friends.

End of Side Sequence

... Now.
Not to say,
.. okay,
.. so what I want you to do is,
.. just make something up.
.. Write .. write a sentence in there .. that might describe .. might give you
some idea of who these people are.
Now we're not wr' .. not not here talking about the writer herself,
we're just, -
.. say it was *you* who was .. inviting all your friends to this concert.

Okay.
Gimme wr' write a sentence that will uh .. write a sentence that will .. wil
will .. uh .. suggest .. some of the kinds of people you might invite.
That's all I'm asking.
... Right.
... [students writing]
Okay.
Who wants to read what you wrote in there.
God.
All that .. all that writing,
and uh, -
S5. [calls on S5]

S5: I wrote um.
I didn't .. I just changed the form (unintelligible).
I put,
[reading] She tells my younger sister and me .. to invite some of our friends
from school who would like to go back into it. (DR)

T: All right.
.. Okay.
Anything,
.. Uh uh that really wasn't the point the point I was talking about.
I was talking about .. when she said. [S6 and S7 raise hands]
She she calls her friends,
.. and invites them to the concert.
Uh .. yeah.. right,
S6. [calls on S6]

S6: [reading] They all drove over and, - (DR)

T: No .. no. [T shakes his head]
You, -

S8: Wait.
Wait.
Okay.

T: You're skipping ahead. [chuckles] [S8 raises hand high]
I want to know something about these friends.

Side Sequence

S: The mother's friends? (Clarifying Question)

T: Shh.
The mother's friends.
Right.
Yeah.

S's: Oh!

S5: I thought you meant the kid's friends.
That's why I said that.

T: Oh. [S7 and S8 have hands raised still]
I'm sorry.

(S8: Can I read mine.)

T: What?

S8: I said I did it just the way you wanted me to. **(Bid to Offer Revision Suggestion)**

End of Side Sequence

T: Yeah.
Good.
How, -
okay.
Right.
L' let's let's hear it .. the mother's friends.
Right.

Solution Phase

S8: [reading] **The friends she invited .. the friends she invites are all presidents of**
the many Rick Springfield Fan Clubs of the Bay Area. (PR)

T: Okay.. [momentary hesitation] o' okay.
Well so so let's say .. w' w' well let's not say,
.. let's not go over **she invites** again.
Right.
Let's not say **the friends she invites.**
L' let's start with **she .. invites,**
... right (unintelligible). [T writes on board]
All of .. she invites all of the Presidents .. of the Rick
.. I'm going to abbreviate Springfield,
Fan Clubs.
Who else does she invite.
... Anybody else?

S: (unintelligible)

T: [chuckles] ... Or actually,
she might,
.. actually we we're exaggerating.
She might have *a* friend.
.. Uh uh why don't we say,
She invites her friend who is President of the Rick Springfield Fan Club.
[reads while writing on the board] **She invites her friend.. who is**
.. President

of the Rick Springfield Fan .. Club.
Right.
... Who else does she invite.

S2: The secretary. {DR}

T: [laughs] The secretary.
... Even the sergeant of arms.
[laughs]

S: (unintelligible)

T: Oh just make somebody up.
We're working on this together now.

S: (Members of her high school alumni association.)

T: Wh' wh' what?
What?

S: Members of her high school alumni association. {PR}

T: Well no.
A friend.
.. An old high school f' buddy.
Right?

S: Right. {Conversational Feedback}

T: Right. [calls on someone]

S: Buddy from high school. {DR}

S: Chum. {DR}

T: Chum [chuckles]
... I want to still say friends.. [writes on board]

S's: (unintelligible offers)

S6: Dentist. {PR}

T: Okay.
Who else does she invite.
.. What?

S6: Her dentist.

S: From San Rafael. [laughs] {PR}

T: [laughs] Okay.
Okay.
Okay.
And even,

.. that's good.
And even her dentist from San Rafael.
[writes on board]
...

Side Sequence

Rafael?
(unintelligible)

S: **(unintelligible)**

T: **A - E - L right?**

S's: **A - E - L.**

T: **A - E - L,**
just like I, -

S's: **(unintelligible)**

S: **You can't tell if we spell it right or wrong anyway. [laughs]**

T: **That's one of my tricks.**
Okay.
... Now.
Okay.

Connection Phase

Now.
What what ... let's ... let me let me just read it from the beginning.
All right.
My mother is an outgoing person when it comes to concerts.
Uh ... this time she phones um ... all all all her friends,
and and asks them to get together for the Rick Springfield concerts at ..
Concord.
She invites her friend who is President of the Rick Springfield Fan Club,
comma,
an old high school friend,
... and even her dentist from San Rafael.
Okay.
... Now.
The point is,
... how long did that take us.
It took us half a minute.
Right?
Well no.
Actually it took us about ten minutes. [laughs]
But if we had known what we were doing it would have taken us half a minute.

And,
all of a sudden,
this becomes a lot more interesting to read.
You see?
Because she doesn't stop at ... she doesn't .. she doesn't just go on to the next
point.
I mean,
we get interested.
So uh ... now.
A lot of that, -
a lot of you were getting that stuff into your writing,
you don't, -
you know sometimes if you look through .. through your papers,
you'll see a star or something?
That means,
as I told you before,
that means,
that .. uh .. many of you have got stuff like this that I really like.
... Some specific detail.
Now.

Modified Solution Phase

Let's see.
...
... [class laughs] Ah ... shall we go ahead with,-
yeah.
(reading) She tells my younger sister and me to invite friends of ours who
would like to go.
Right.
Okay.
What what friends, -
okay .. now .. uh uh we got the idea.
Now,
what friends might like to go.
...

S: (overlapping, unintelligible)

T: I think uh, -
Sh.
I think of *who* who might like to go.

S6: (unintelligible)

T: What?

S6: (unintelligible, giggles)

T: I think of, -
All right.

Yeah.
I think of uh .. I think of all the fir' Rick Springfield fans I know,
and, -
maybe on the other hand,
right?
Some people who've never heard,-
nuh .. and s' s' sometimes and others who have never heard of him,
right?
So ... you know.
There's all kinds of possibilities.

Connection Phase

T: ... So then .. in other words,
always push yourself,
push yourself for details.
It'll just make, -
it it it'll make .. it'll make .. you'll have more fun writing,
and,
it'll be .. it's mo' it'll be more interesting to read.
... Okay.
[T goes on to different problem in second paragraph]

NATIONAL CENTER FOR THE STUDY OF WRITING
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The National Center for the Study of Writing, one of the national educational research centers sponsored by the U.S. Department of Education's Office of Educational Research and Improvement, is located at the Graduate School of Education at the University of California at Berkeley, with a site at Carnegie Mellon University in Pittsburgh, Pennsylvania. The Center provides leadership to elementary and secondary schools, colleges, and universities as they work to improve the teaching and learning of writing. The Center supports an extensive program of educational research and development in which some of the country's top language and literacy experts work to discover how the teaching and learning of writing can be improved, from the early years of schooling through adulthood. The Center's four major objectives are: (1) to create useful theories for the teaching and learning of writing; (2) to understand more fully the connections between writing and learning; (3) to provide a national focal point for writing research; and (4) to disseminate its results to American educators, policy-makers, and the public. Through its ongoing relationship with the National Writing Project, a network of expert teachers coordinated through Berkeley's Graduate School of Education, the Center involves classroom teachers in helping to shape the Center's research agenda and in making use of findings from the research. Underlying the Center's research effort is the belief that research both must move into the classroom and come from it; thus, the Center supports "practice-sensitive research" for "research-sensitive practice."

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